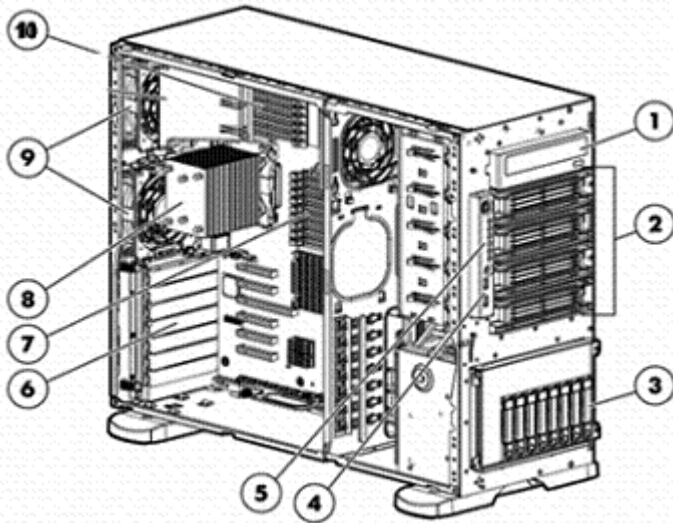


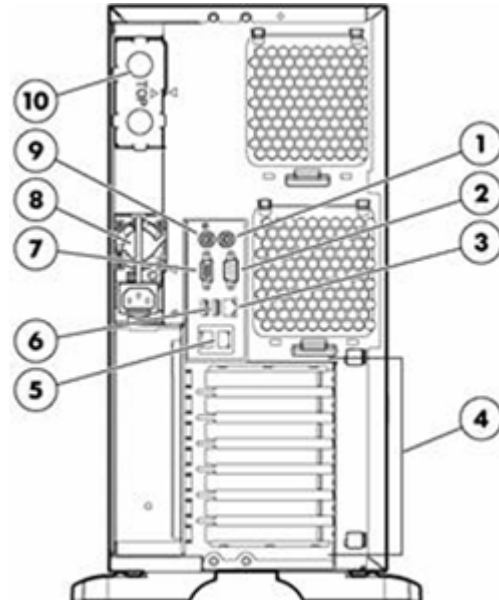
### Overview

The HP ProLiant ML350 G6 is the best price-performance, dual-processor Tower server that delivers excellence with performance, expandability and availability. The G6 server has more memory capacity and HDD expandability than previous generations. It combines the latest Intel Xeon 5600 processors with QPI technology, best-in-class availability features, and unsurpassed flexibility in a system ideal for growing businesses and especially well suited to meet the needs of remote branch offices.



#### Front View:

1. SATA DVD ROM or DVD RW optical drive
2. Four (4) removable media bays
3. Eight (8) 2.5" (shown) or six (6) 3.5" SAS or SATA hot plug drive bays
4. Two (2) USB ports
5. LEDs: System power, Health, Power cap, NIC 1&2, UID
6. Six (6) expansion slots
7. Nine (9) DIMM slots (Processor 2): DDR3 Registered (RDIMM) or Unbuffered (UDIMM) memory
8. Processor heatsink
9. Three (3) system fans
10. Nine (9) DIMM slots (Processor 1): DDR3 Registered (RDIMM) or Unbuffered (UDIMM) memory



#### Rear View:

1. PS/2 mouse port
2. Serial port
3. Dedicated remote management port
4. Six (6) expansion slots
5. Two (2) network ports
6. Two (2) USB ports
7. Video port
8. Power supply bay 1
9. PS/2 keyboard port
10. Power supply bay 2

### What's New

- Support for new HP Hard Drive.

### Standard Features

**NOTE:** For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

#### Processor

One of the following  
depending on Model

#### Six-Core Processors

Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor  
Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor  
Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor  
Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor  
Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor  
Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W,DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

#### Quad-Core Processors

Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W,DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor  
Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo) Processor  
Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo) Processor  
Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor  
Intel® Xeon® X5570 (2.93GHz/4-core/8MB/95W, DDR3-1333, HT, Turbo 2/2/3/3) Processor  
Intel® Xeon® X5560 (2.80GHz/4-core/8MB/95W, DDR3-1333, HT, Turbo 2/2/3/3) Processor  
Intel® Xeon® X5550 (2.66GHz/4-core/8MB/95W, DDR3-1333, HT, Turbo 2/2/3/3) Processor  
Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
Intel® Xeon® E5607 (2.26GHz/4-core/4MB/80W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor  
Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) Processor  
Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W, DDR3-800) Processor  
Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
Intel® Xeon® L5520 (2.26GHz/4-core/8MB/60W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
Intel® Xeon® L5506 (2.13GHz/4-core/4MB/60W, DDR3-800) Processor  
Intel® Xeon® E5606 (2.13 GHz, 8MB, 80W,DDR3-1066, HT, Turbo 1/1/2/2/3/3) Processor

#### Dual-Core Processors

Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W, DDR3-800) Processor  
Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W, DDR3-800) Processor

**NOTE:** HT indicates that the processor model supports Intel® Hyper-Threading Technology.

**NOTE:** Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active.

**NOTE:** DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

**NOTE:** For the Intel 5600 and 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

**NOTE:** Customers transitioning from 5500 series processors to 5600 series processors must include a third fan along with the two fans present on the server



Standard Features

Cache Memory One of the following depending on Model	12MB (1 x 12MB) Level 3 cache <b>NOTE:</b> For 5600 series processors (other than those indicated below) 8MB (1 x 8MB) Level 3 cache <b>NOTE:</b> For E5606/E5607/X5570/X5560/X5550/E5540/E5530/E5520/L5520 processors 4MB (1 x 4MB) Level 3 cache <b>NOTE:</b> For E5603/E5507/E5506/E5504/E5503/E5502/L5506 processors	
Chipset	Intel® 5520 Chipset <b>NOTE:</b> For more information regarding Intel® chipsets, please see the following URL: <a href="http://www.intel.com/products/server/chipsets/">http://www.intel.com/products/server/chipsets/</a> .	
Upgradeability	Upgradeable to two processors <b>NOTE:</b> total 4, 8 or 12 cores	
Memory Protection	Advanced ECC Mirroring mode Lock-step mode Online Spare (Requires X5600 or E5600 processor family)	
Memory One of the following depending on model	Type	DDR3 Registered (RDIMM) or Unbuffered (UDIMM)
	Standard (Performance Models)	12 GB (6 x 2 GB) RDIMM
	Standard (Base Models)	6 GB (3 x 2 GB) RDIMM
	Standard (Entry Models)	4 GB (2 x 2 GB) RDIMM
	Standard (Entry Models)	4 GB (1 x 4 GB) RDIMM
	Maximum (RDIMM)	288 GB (18 x 16 GB) RDIMM
	Maximum (UDIMM)	48 GB (12 x 4 GB)
	<b>NOTE:</b> Depending on the memory configuration and processor model, the memory speed may run at 1333MHz, 1066MHz, or 800MHz. Please see the Online Memory Configuration Tool at: <a href="http://www.hp.com/go/ddr3memory-configurator">www.hp.com/go/ddr3memory-configurator</a> . <b>NOTE:</b> The 16 GB memory module is a quad ranked 800MHz DDR3 memory.	
Network Controller	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter	

### Standard Features

#### Expansion Slots

Expansion Slot #	Technology	Bus Width	Connector Width	Bus Number	Form Factor	Notes
6	PCI Express Gen2	x4	x8	5	Standard Height/Length	
5	PCI Express Gen2	x4	x8	8	Standard Height/Length	
4	PCI Express Gen2	x8	x16	11	Standard Height/Length	
3	PCI Express Gen2	x8	x8	14	Standard Height/Length	
2	PCI Express Gen2	x4	x8	17	Standard Height/Length	
1	PCI Express Gen2	x4	x8	20	Standard Height/Length	

**NOTE:** Bus number - Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number

\*\* Indicates the number of physical electrical lanes running to the connector.

**NOTE:** Six total expansion slots. One PCI-Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2 (x8 speed); Four PCI-Express x8 Gen2 (x4 speed). Optional PCI-X Expander provides additional two 64-bit/100-MHz PCI-X slots by using a single PCI Express slot.

#### Storage Controller One of the following depending on model

Entry Models	Embedded HP Smart Array P410i/Zero Memory Controller (RAID 0/1/1+0)
Base Models	Embedded HP Smart Array P410i/256MB Controller (RAID 0/1/1+0/5/5+0) Embedded HP Smart Array P410i/512 MB BBWC Controller (RAID 0/1/1+0/5/5+0)
Performance Models	Embedded HP Smart Array P410i/1GB FBWC Controller
Available upgrades: 256MB, 512MB with BBWC, Battery kit upgrade (for BBWC), and Smart Array Advanced Pack (SAAP)	

#### Internal Storage Devices

Diskette Drive	None included standard (not supported)
Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive
Hard Drives	None standard

#### Maximum Internal Storage One of the following depending on model

Hot Plug LFF SAS	24TB	8 x 3TB
Hot Plug LFF SATA	24TB	8 x 3TB
Hot Plug SFF SAS	16TB	16 x 1TB
Hot Plug SFF SATA	16TB	16 x 1TB
Hot Plug SFF SSD	6.4TB	16 x 400GB



## Standard Features

Interfaces	Serial	1
	Network RJ-45	3 (1 dedicated for HP Integrated Lights-Out 2 (iLO2))
	Keyboard	1
	Pointing Device (Mouse)	1
	Graphics	1
	SD slot	1 (internal)
	USB 2.0 Ports	6 (2 front, 2 rear, 2 internal)
<b>NOTE:</b> Please see the following URL for additional information regarding USB support: <a href="http://h18004.www1.hp.com/products/servers/platforms/usb-support.html">http://h18004.www1.hp.com/products/servers/platforms/usb-support.html</a> .		

Industry Standard Compliance	ACPI V2.0 Compliant
	PCI-Express Gen2
	PXE Support
	WOL Support
	PCI-X 1.0a Compliant
	Novell Certified
	Microsoft® Logo certifications
	USB 2.0 Support
SMBIOS 2.6.1	

Server Power Cords	ProLiant ML servers in a rack-mount configuration no longer ship standard with NEMA power cords that allow connection to 110V US wall outlets in a home or office. These servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant ML rack-mount server using a 110V receptacle (NEMA-15), the NEMA power cord must be ordered separately. The 12' cord (AF556A) or 6' cord (187335-001) can be purchased online at HP.COM. In a tower configuration, the servers ship standard with a 6' country specific NEMA power cord. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific sku. Please see the following power cord matrix: <a href="http://www.hp.com/go/powercordmatrix">http://www.hp.com/go/powercordmatrix</a> .
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Power Supply	HP 750W CS HE Gold Power Supply (standard on some models)
One of the following depending on Model	HP 460W CS HE Gold Power Supply (standard on some models)



### Standard Features

#### Common Slot Power Supplies

HP has a new design for ProLiant power- the new Common Slot Power Supply bay. This design provides the customer with commonality in power supplies across multiple platforms to save on the cost of spares and allows HP to offer multiple power solutions to fit the customers' needs. Many HP ProLiant Servers come with Common Slot, High Efficiency and Right-Size Power Supplies. The new HP Common Slot power supplies are designed for the highest power efficiency without degrading performance of the ProLiant server. Power Supplies have efficiency ratings up to 92%. There are three Right Size power options available depending on the configuration of your server. To make sure you select the correct power supply to meet your configuration, please use the HP Power Advisor at: [www.hp.com/go/proliant-energy-efficient](http://www.hp.com/go/proliant-energy-efficient) or [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor). All HP Common Slot power sources are UL, CE Mark Compliant, Hot Plug and Redundant.

It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your needs.

The HP ProLiant Common Slot Power supplies meet multiple Energy Efficiency Initiatives: Climate Savers Computing Initiative GOLD and ECOS Consulting 80PLUS GOLD for the 460w and 750w Power Supplies and Climate Savers Computing Initiative Silver, ECOS Consulting 80PLUS Silver for 1200w Power Supply. HP has also been working with the EPA on developing an ENERGY STAR® Computer Server specification and plans on offering models that meet the requirements when they are published. Please visit the ENERGY STAR website at [www.energystar.gov](http://www.energystar.gov) for updates on the specification development process and approved platforms.

The HP Power Advisor is located at: [www.hp.com/go/proliant-energy-efficient](http://www.hp.com/go/proliant-energy-efficient) or [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor)

#### System Fans

3 system fans ship standard

**NOTE:** Does not include power supply or processor heat sink fans.

N+1 fan redundancy optional with redundant fan kit

#### Required Cabling

For required cabling information, refer to the HP ProLiant ML350 G6 cabling matrix at: <http://www.hp.com/servers/proliantML350>.

**NOTE:** Please see the "Storage" section of this QuickSpecs for important information on controllers and cables required to support SAS or SATA hard drives as well as storage management software available for SATA hard drives.

#### Operating Systems and Virtualization Software Support for ProLiant Servers

Microsoft Windows Server

Red Hat Enterprise Linux (RHEL)

SUSE Linux Enterprise Server (SLES)

NetWare

**NOTE:** NetWare support on Intel Xeon 5500 family only.

VMware

HP Citrix Essentials for XenServer

**NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: <http://www.hp.com/go/ossupport> and our driver download page [www.hp.com/support/ML350G6](http://www.hp.com/support/ML350G6).



### Standard Features

#### Graphics

Integrated ATI RN50, 64MB video standard

- 16 bit color: maximum resolution of 1600 x 1200
- 32 bit color: maximum resolution of 1280 x 1024

**NOTE:** Maximum resolution available via iLO remote console is 1280 x 1024.

#### Form Factor

Tower or Rack (5U)

**NOTE:** Rack models (with a Tower to Rack conversion kit) support:

- Square or round hole racks 24"- 36" deep, including HP Rack System /E and HP Systems
- Telco racks with 3rd part option kit from Rack Solutions  
<http://www.racksolutions.com/hp>

#### HP Insight Management Control Software

HP Insight Foundation

Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters.

HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: <http://www.hp.com/go/foundation>

The foundation pack includes:

- HP SmartStart
- HP Management DVD
- HP ProLiant Smart Update Firmware DVD

**NOTE:** In an effort to support reducing our environmental impact, the HP Insight Foundation Suite for ProLiant media will be available as a selectable option for this server at time of order of a CTO SKU. This will allow customers to order the number of media kits that best meet their needs and eliminate receiving unnecessary duplicate media.

HP Integrated Lights-Out (iLO)

HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit: [www.hp.com/go/iLO](http://www.hp.com/go/iLO)



Standard Features

Intelligent Manageability	HP Systems Insight Manager SmartStart Redundant ROM System Firmware Update ROMPaq ProLiant RBSU (ROM-Based Setup Utility) Automatic Server Recovery-2 (ASR-2) Dynamic Sector Repairing (with Smart Array Controller) Drive Parameter Tracking (with Smart Array Controller) Pre-Failure Warranty (covers processors, memory, and SAS hard drives)
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Security	Power-on password Setup password Serial interface control Disk configuration lock Power switch security
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Warranty	<p>This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.</p> <p><b>NOTE:</b> Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: <a href="http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html">http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html</a></p>
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Optional Features

HP Insight Management Software    HP Insight Control

HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console.

Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See [www.hp.com/go/insightcontrol](http://www.hp.com/go/insightcontrol)

HP Insight Dynamics

HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: <http://www.hp.com/services/insight>.

HP Insight Dynamics for ProLiant, a product option, is advanced infrastructure management software that enables IT staff to instantly adjust their environments to meet dynamic business demands by provisioning, optimizing and protecting complex infrastructure in minutes. It's a powerful toolkit, integrated-by-design, that accelerates complex technology projects and simplifies daily operations, transforming data center economics. With Insight Dynamics IT professionals can plan capacity and power continuously, balance workloads across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location.

**NOTE:** For more information, visit: <http://www.hp.com/go/insightdynamics>

HPC Interconnects

**NOTE:** High Performance Computing (HPC) interconnect technologies are available for this server under the HP Cluster Platform product portfolio. These high-speed interconnects are fully supported by HP when they are part of these configure to order clusters. Solutions can be defined with a lot of flexibility with the help of configuration tools. Please visit the following URL to configure HPC Clusters with InfiniBand Interconnects: <http://www.hp.com/techservers/clusters/ucp/index.html>

InfiniBand

PCI-Express Generation 2 adapters



### Optional Features

#### Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: <http://www.hp.com/go/factory-express>

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#### HP Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. For additional information please visit: <http://www.hp.com/products/configurator>



### Service and Support

#### 300 Series Servers

##### Service and Support

##### HP Technology Services for Industry Standard Servers and BladeSystem

Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

##### What HP ProLiant and BladeSystem Services can do for you

HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs:

##### HP Technology Services meets business challenges with services offered in three packages -

Optimized Care Package, Standard Care Package, and Basic Care Package - available for each product group. Such packaged solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support packages for servers, storage, networking and software.

##### Optimized Care Package Supports maintaining servers at optimum performance availability

##### HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner  
<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

##### HP Installation and Startup for Insight Control Software

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers  
<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

##### 3-Year HP Critical Advantage

Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment  
<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW>

**Additional Services:** Microsoft or Linux or VMware education courses + Facility & technology environmental assessment services + Energy Efficiency Design, Factory Express

##### Standard Care Package Package that maintains high level of server availability

##### HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner  
<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

##### HP Installation and Startup for Insight Control Software

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers  
<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

##### 3-Year HP 6 hour Hardware Support Onsite Call-to-Repair Service



### Service and Support

Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf>

#### **3-Year , HP 24x7 Software Support for Insight Control**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf>

**Additional Services** - Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up, and Software Support; Install and Startup Services for Insight Control; Microsoft or Linux or VMware education courses; +30 Proactive Select Credits, Factory Express

### Basic Care Package

**Delivers minimum recommended support service level**

#### **HP ProLiant Server Hardware Installation**

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

#### **HP Installation and Startup for Insight Control Software**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

#### **3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

#### **3-Year , HP 24x7 Software Support for Insight Control**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf>

**Additional Services:** Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); +10 Proactive Select Credits, Factory Express

### Insight Remote Support

The packages include HP Insight Remote Support that uses proven technology to deliver secure, reliable 24x7 remote monitoring, diagnoses, and problem resolution. It is available at no additional cost to all warranty, HP Care Pack Service, and service agreement customers.

### For more information

To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: <http://www.hp.com/services/proliant>



### Pre-configured Models

**NOTE:** For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

**NOTE:** Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.

**NOTE:** HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.

**NOTE:** If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.

**NOTE:** Not all models are available in all regions. Check with your local country HP offices for availability.

### Entry Models

<b>HP ProLiant ML350 G6 E5504 1P 4GB-R P410i/ZM 460W RPS Tower Server 487932-xx1</b>	<b>Processor</b>	(1) Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W, DDR3-800) Processor
	<b>Cache Memory</b>	4MB (1 x 4MB) L3 cache
	<b>Memory</b>	4GB (2 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	HP Smart Array P410i/Zero Memory Controller
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	(6) LFF SATA/SAS HDD bays; upgradeable to (8) in total
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(1) 460 Watt Hot-Plug (Redundancy enabled) power supply
	<b>Fans</b>	3 fans ship standard
	<b>Accessories</b>	PS/2 Keyboard and Mouse ship standard
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

<b>HP ProLiant ML350 G6 E5606 1P 4GB-R P410i/ZM 460W RPS LFF Tower Server 638180-xx1</b>	<b>Processor</b>	(1) Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2/3/3) Processor
	<b>Cache Memory</b>	8MB (1 x 8MB) L3 cache
	<b>Memory</b>	4GB (1 x 4GB) PC3-10600R (DDR3-1333) Registered DIMMs
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	HP Smart Array P410i/Zero Memory Controller
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	(6) LFF SATA/SAS HDD bays; upgradeable to (8) in total
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(1) 460 Watt Hot-Plug (Redundancy enabled) power supply
	<b>Fans</b>	3 fans ship standard
	<b>Accessories</b>	PS/2 Keyboard and Mouse ship standard
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response



### Pre-configured Models

#### Base Models

<b>HP ProLiant ML350 G6</b> <b>E5645 1P 6GB-R</b> <b>P410i/256 750W RPS</b> <b>SFF Server</b> <b>638181-xx1</b>	<b>Processor</b>	(1) Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor
	<b>Cache Memory</b>	12MB (1 x 12MB) L3 cache
	<b>Memory</b>	6GB (3 x 2GB) PC3-10600 (DDR3-1333) Registered DIMMs
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded HP Smart Array P410i/256MB Controller
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	(8) SFF SAS/SATA HDD Bays; upgradeable to (16)
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(1) 750 Watt Hot-Plug (Redundancy enabled) power supply
	<b>Fans</b>	3 fans ship standard
	<b>Accessories</b>	PS/2 Keyboard and Mouse ship standard
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

<b>HP ProLiant ML350 G6</b> <b>E5520 1P 6GB-R</b> <b>P410i/256 750W RPS</b> <b>Tower Server</b> <b>487930-xx1</b>	<b>Processor</b>	(1) Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor
	<b>Cache Memory</b>	8MB (1 x 8MB) L3 cache
	<b>Memory</b>	6GB (3 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded HP Smart Array P410i/256MB Controller
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	(8) SFF SAS/SATA HDD Bays; upgradeable to (16)
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(1) 750 Watt Hot-Plug (Redundancy enabled) power supply
	<b>Fans</b>	3 fans ship standard
	<b>Accessories</b>	PS/2 Keyboard and Mouse ship standard
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response



### Pre-configured Models

<b>HP ProLiant ML350 G6</b> <b>E5520 1P 6GB-R</b> <b>P410i/256 750W RPS</b> <b>Rack Server</b> <b>487931-xx1</b>	<b>Processor</b>	(1) Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor
	<b>Cache Memory</b>	8MB (1 x 8MB) L3 cache
	<b>Memory</b>	6GB (3 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded HP Smart Array P410i/256MB Controller
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	(8) SFF SAS/SATA HDD Bays; upgradeable to (16)
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(1) 750 Watt Hot-Plug (Redundancy enabled) power supply
	<b>Fans</b>	3 fans ship standard
	<b>Form Factor</b>	Rack (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

<b>HP ProLiant ML350 G6</b> <b>E5620 1P 6GB-R</b> <b>P410i/256 460W RPS</b> <b>Tower Server</b> <b>594869-xx1</b>	<b>Processor</b>	(1) Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo (1/1/2/2) Processor
	<b>Cache Memory</b>	12MB (1 x 12MB) L3 cache
	<b>Memory</b>	6GB (3 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded HP Smart Array P410i/256MB Controller
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	(8) SFF SAS/SATA HDD Bays; upgradeable to (16)
	<b>Optical Drive</b>	SATA DVD ROM
	<b>Power Supply</b>	(1) 460 Watt Hot-Plug (Redundancy enabled) power supply
	<b>Fans</b>	3 fans ship standard
	<b>Accessories</b>	PS/2 Keyboard and Mouse ship standard
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response



### Pre-configured Models

#### Performance Models

<b>HP ProLiant ML350 G6</b> <b>E5530 2P 12GB-R</b> <b>P410i/512 BBWC 750W</b> <b>RPS Tower Server</b> <b>487928-xx1</b>	<b>Processor</b>	(2) Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processors
	<b>Cache Memory</b>	8MB (1 x 8MB) L3 cache
	<b>Memory</b>	12 GB (6 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded HP Smart Array P410i/512MB with BBWC
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	2.4 TB SFF(2.5-inch) SAS 2.0 TB SFF(2.5-inch) SATA
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(2) 750 Watt Hot-Plug Redundant power supplies
	<b>Fans</b>	4 fans ship standard
	<b>Accessories</b>	PS/2 Keyboard and Mouse ship standard
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

<b>HP ProLiant ML350 G6</b> <b>E5530 2P 12GB-R</b> <b>P410i/512 BBWC 750W</b> <b>RPS Rack Server</b> <b>576778-xx1</b>	<b>Processor</b>	(2) Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processors
	<b>Cache Memory</b>	8MB (1 x 8MB) L3 cache
	<b>Memory</b>	12 GB (6 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded HP Smart Array P410i/512MB with BBWC
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	2.4 TB SFF(2.5-inch) SAS 2.0 TB SFF(2.5-inch) SATA
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(2) 750 Watt Hot-Plug Redundant power supplies
	<b>Fans</b>	4 full Redundant fans
	<b>Insight Control</b>	HP Insight Control Environment No Media single server license, including 1 year of 24x7 Technical Support and Updates
	<b>Form Factor</b>	Rack (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response





Pre-configured Models

HP ProLiant ML350 G6 X5650 2P 12GB-R P410i/1GB FBWC 750W RPS Tower Server 594874-xx1	Processor	(2) Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processors
	Cache Memory	12MB (1 x 12MB) L3 cache
	Memory	12 GB (6 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs
	Network Controller	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	Storage Controller	Embedded HP Smart Array P410i/1G FBWC Controller
	Hard Drive	None ship standard
	Internal Storage	(8) SFF SAS/SATA HDD Bays; upgradeable to (16)
	Optical Drive	SATA DVD ROM
	Power Supply	(2) 750 Watt Hot-Plug Redundant power supplies
	Fans	4 full Redundant fans
Accessories		PS/2 Keyboard and Mouse ship standard
Form Factor		Tower (5U)
Warranty		Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

Country Code Key

xx=00  
xx=01  
xx=03  
xx=04  
xx=05  
xx=20  
xx=29  
xx=37  
xx=42  
xx=AA

Tower Code Key

US  
Australia  
UK  
Germany  
France  
Brazil  
Japan  
ADP  
Europe  
PRC

Rack Code Key

US  
N/A  
N/A  
N/A  
N/A  
N/A  
Japan  
ADP  
Europe  
PRC



Configuration Information - Factory Integrated Models

**NOTE:** This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.

**NOTE:** Configure-to-order (CTO) servers must start with a CTO Chassis.

**NOTE:** FIO indicates that this option is only available as a factory installable option.

Step 1: Base Configuration (choose one of the following configurable models)

HP Models	<b>ML350G6 Tower Models</b>	
	HP ProLiant ML350 G6 SFF Configure-to-order Tower Chassis	483447-B21
	<b>Includes:</b>	
	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter	
	Embedded Smart Array P410i Controller	
	Eight (8) Hot-Plug (SFF) SAS/SATA Drive Bays	
	Seven (7) HDD blanks	
	Six (6) Expansion slots: One Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2 (x8 speed); Four PCI-Express x8 Gen2 (x4 speed)	
	Six (6) USB ports	
	PS/2 Keyboard & Mouse (selection required)	
	Tower Form Factor	
	HP ProLiant ML350 G6 LFF Configure-to-order Tower Chassis	483448-B21
	<b>Includes:</b>	
	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter	
	Embedded Smart Array P410i Controller	
	Six (6) Hot-Plug (LFF) SAS/SATA Drive Bays	
	Five (5) HDD blanks	
	Six (6) Expansion slots: One Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2(x8 speed); Four PCI-Express x8 Gen2 (x4 speed)	
	Six (6) USB ports	
	P/S 2 Keyboard & Mouse (selection required)	
	Tower Form Factor	
	<b>ML350G6 Rack Models</b>	
	HP ProLiant ML350 G6 SFF Configure-to-order Rack Server	483443-B21
	<b>Includes:</b>	
	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter	
	Embedded Smart Array P410i Controller	
	Eight (8) Hot-Plug (SFF) SAS/SATA Drive Bays	
	Seven (7) HDD blanks	
	Six (6) Expansion slots: One Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2 (x8 speed); Four PCI-Express x8 Gen2 (x4 speed)	
	Six (6) USB ports	
	Rack (5U) Form Factor	
	HP ProLiant ML350 G6 LFF Configure-to-order Rack Server	483444-B21
	<b>Includes:</b>	
	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter	
	Embedded Smart Array P410i Controller	
	Six (6) Hot-Plug (LFF) SAS/SATA Drive Bays	
	Five (5) HDD blanks	
	Six (6) Expansion slots: One Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2	

### Configuration Information - Factory Integrated Models

(x8 speed); Four PCI-Express x8 Gen2 (x4 speed)  
Six (6) USB ports  
Rack (5U) Form Factor

### Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

#### HP Processors

##### Six-Core Processors

HP ML350 G6 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) FIO Processor Kit	638315-L21
HP ML350 G6 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) FIO Processor Kit	601238-L21
HP ML350 G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) FIO Processor Kit	601240-L21
HP ML350 G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	638316-L21
HP ML350 G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	638317-L21

##### Quad-Core Processors

HP ML350 G6 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) FIO Processor Kit	638314-L21
HP ML350 G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	601246-L21
HP ML350 G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	638318-L21
HP ML350 G6 Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) FIO Processor Kit	638319-L21
HP ML350 G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) FIO Processor Kit	638320-L21
HP ML350 G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	601252-L21

**NOTE:** Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors

#### HP Memory

##### Registered DIMMs (RDIMMs)

**NOTE:** Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-B21



### Configuration Information - Factory Integrated Models

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604506-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit 627812-B21

**NOTE:** Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors

**Unbuffered with ECC DIMMs (UDIMMs)**

**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator).

**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see:

<http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500668-B21

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500670-B21

HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500672-B21

HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit 619488-B21

#### HP Power Supplies

**NOTE:** Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor)

HP 460W Common Slot Gold Hot Plug Power Supply Kit 503296-B21

HP 750W Common Slot Gold Hot Plug Power Supply Kit 512327-B21

HP 1200W Common Slot Silver Hot Plug Power Supply Kit 500172-B21

**NOTE:** Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.

### Step 3: Choose Additional Factory Integratable Options

**HP Storage Controllers** HP Smart Array P212/256 BBWC 1-ports Int/1-ports Ext PCIe x8 FIO SAS Controller 491191-B21  
**NOTE:** SAS Controller supporting RAID 0/1/1+0/5.

HP Smart Array P411/256 BBWC 2-ports Ext PCIe x8 FIO SAS Controller 491193-B21  
**NOTE:** SAS Controller supporting RAID 0/1/1+0/5.

#### Upgrade Options

HP 256MB Factory Integrated P-Series Cache Module 534108-B21  
**NOTE:** Available for P410i only.

**HP Insight Software** HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License 582765-B21

HP Insight Control for Linux including 1yr 24x7 Support ML/DL Bundle 1 Server FIO License TC203A

**HP Performance Packs** Performance Packs are necessary to configure a HP ProLiant ML350 G6 to a High Performance Model which includes the latest performance technologies and enterprise class availability features pre-installed for convenience and value. The Performance Pack includes a 2nd processor, 512MB cache with BBWC for P410i (650 mAh P-



## Configuration Information - Factory Integrated Models

Series Battery), redundant fan, and (1) 750W CS HE Power supply kit.

**NOTE:** Must also select 447326-B21 (SATA DVD ROM) to achieve parity to ML350 G6 High Performance Models.

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## Step 4: Choose Additional Options for Factory Integration

**NOTE:** For additional options, please refer to the "Core Options" and "Additional Options" section below.



### Core Options

**NOTE:** Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Unique Options	HP ML350 G6 Redundant Fan/Baffle Kit	515081-B21
	HP ML350/ML330G6 2 Slot PCI-X Riser Kit	488413-B21
	<b>NOTE:</b> The HP PCI-X Expander kit converts a single PCI Express slot (Slot 1) into two full height, full length 64-bit 100MHz PCI-X slots. The PCI-X Expander Kit can only be plug in Slot 1.	
	HP ML350G6 Tower to Rack Conversion Kit	534534-B21
	<b>NOTE:</b> See "Redundant Options" section below for Hot Plug Redundant Power supplies.	
	HP 2.5 Hard Disk Drive Blank Kit	503771-B21

### HP Processors

#### Six-Core Processors

HP ML350 G6 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) Processor Kit	638315-B21
HP ML350 G6 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) Processor Kit	601236-B21
HP ML350 G6 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) Processor Kit	601238-B21
HP ML350 G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) Processor Kit	601240-B21
HP ML350 G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) Processor Kit	638316-B21
HP ML350 G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor Kit	638317-B21

#### Quad-Core Processors

HP ML350 G6 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) Processor Kit	638314-B21
HP ML350 G6 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) Processor Kit	601242-B21
HP ML350 G6 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) Processor Kit	601244-B21
HP ML350 G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) Processor Kit	601246-B21
HP ML350 G6 Intel® Xeon® E5607 (2.26GHz/4-core/4MB/80W) Processor Kit	638318-B21
HP ML350 G6 Intel® Xeon® E5606 (2.13GHz/4-core/4MB/80W) Processor Kit	638319-B21
HP ML350 G6 Intel® Xeon® E5603 (2.00GHz/2-core/4MB/80W) Processor Kit	638320-B21
HP ML350 G6 Intel® Xeon® X5570 (2.93GHz/4-core/8MB/95W) Processor Kit	495904-B21
HP ML350 G6 Intel® Xeon® X5560 (2.80GHz/4-core/8MB/95W) Processor Kit	495906-B21
HP ML350 G6 Intel® Xeon® X5550 (2.66GHz/4-core/8MB/95W) Processor Kit	495908-B21
HP ML350 G6 Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W) Processor Kit	495910-B21
HP ML350 G6 Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W) Processor Kit	495912-B21
HP ML350 G6 Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W) Processor Kit	495914-B21
HP ML350 G6 Intel® Xeon® E5507 (2.26 GHz/4-core/4MB/80W) Processor Kit	601248-B21
HP ML350 G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) Processor Kit	495916-B21
HP ML350 G6 Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W) Processor Kit	495918-B21
HP ML350 G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) Processor Kit	601252-B21
HP ML350 G6 Intel® Xeon® L5520 (2.26GHz/4-core/8MB/60W) Processor Kit	505513-B21
HP ML350 G6 Intel® Xeon® L5506 (2.13GHz/4-core/4MB/60W) Processor Kit	495902-B21

#### Dual-Core Processors

HP ML350 G6 Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W) Processor Kit	601250-B21
HP ML350 G6 Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W) Processor Kit	495920-B21



### Core Options

#### HP Memory

##### Registered RDIMMs

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604506-B21
<b>NOTE:</b> Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors	
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21

##### Unregistered with ECC UDIMMs

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21

**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator).

**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: [www.hp.com/go/proliant-energy-efficient](http://www.hp.com/go/proliant-energy-efficient).



### Core Options

HP Drive Cage Options	HP ML350/370 G6 8 Small Form Factor (SFF) 2nd Drive Cage Kit	507803-B21
	<b>NOTE:</b> The Second drive cage installation replaces 2 internal optical bays. It is required to purchase a SAS RAID controller or SAS Expander Card to support over 8 HDD <b>NOTE:</b> To cover an empty SFF HDD slot, please order the following SFF hard drive blank spare kit: 392613-001	
	HP ML350/ML/DL370G6 2 Large Form Factor Drive Kit	487936-B21
	<b>NOTE:</b> The Second drive cage installation replaces 2 internal optical bays. <b>NOTE:</b> To cover an empty LFF HDD slot, please order the following LFF hard drive blank spare kit: 389015-001	

HP Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD-RW Optical Drive	447328-B21
	<b>NOTE:</b> Please note that some of the earlier BTO models may not support adding SATA Optical Drives. To ensure compatibility of the SATA Optical Drives, please add additional optical drives only on models with Quad-Core 5400 Series.	

HP Hard Drives	<b>SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives</b>	
	HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	619291-B21
	HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
	HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
	HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Hot Plug Enterprise 3 yr Warranty Hard Drive	627117-B21
	HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
	HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
	HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21
	<b>SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives</b>	
	HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
	HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
	HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
	<b>SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives</b>	
	HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	625031-B21
	HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
	HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21





### Core Options

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/12244\\_div/12244\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html)  
(Worldwide)

#### SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive 605835-B21

HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive 507610-B21

#### SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives

HP 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive 625609-B21

HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive 507750-B21

#### SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives

HP 3TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive 628059-B21

HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive 507632-B21

HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive 454146-B21

HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive 458928-B21

#### SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives

HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive 571230-B21

HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive 458945-B21

**NOTE:** SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13021\\_div/13021\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html)  
(Worldwide)

#### SATA Hot Plug 2.5" Enterprise Mainstream Solid State Drives

HP 100GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636593-B21

HP 200GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636595-B21

HP 400GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636597-B21

#### SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

HP 100GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636607-B21

HP 200GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636609-B21

HP 400GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636611-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13415\\_div/13415\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13415_div/13415_div.html)  
(Worldwide)

#### 6G SAS Hot Plug Enterprise Performance Solid State Drives

HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive 632494-B21



### Core Options

HP 200GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive 632492-B21

#### 6G SAS Hot Plug Enterprise Mainstream Solid State Drives

HP 800GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 632506-B21

HP 400GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 632504-B21

HP 200GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 632502-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/14038\\_div/14038\\_div.html](http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html) (Worldwide)

**NOTE:** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

**NOTE:** Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

### HP Networking

#### Gigabit Ethernet adapters

HP NC112T PCI Express Gigabit Server Adapter 503746-B21

HP NC360T PCI-E Dual Port Gigabit Server Adapter 412648-B21

HP NC364T PCI-E Quad Port Gigabit Server Adapter 435508-B21

**NOTE:** Does not support Windows 2000.

**NOTE:** There is a maximum of five NC364T PCI Express Quad Port Gigabit Server Adapter NICs allowed in this server.

HP NC365T 4-port Ethernet Server Adapter 593722-B21

HP NC373F PCI-E Multifunction 1000SX Gigabit Svr Adapter 394793-B21

HP NC373T PCI-E Multifunction Gigabit Server Adapter 394791-B21

HP NC375T PCI Express Quad Port Gigabit Server Adapter 538696-B21

HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter 458492-B21

#### 10 Gigabit Ethernet adapters

HP NC522SFP Dual Port 10GbE Server Adapter 468332-B21

HP NC523SFP 10Gb 2-port Server Adapter 593717-B21

HP NC550SFP Dual Port 10GbE Server Adapter 581201-B21

HP NC552SFP 10Gb 2-port Ethernet Server Adapter 614203-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: [www.hp.com/go/ProLiantNICs](http://www.hp.com/go/ProLiantNICs)



Core Options

HP Power Supplies

**NOTE:** Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor).

**Power Supplies**

HP 460W Common Slot Gold Hot Plug Power Supply Kit	503296-B21
HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21
HP 1200W Common Slot Silver Hot Plug Power Supply Kit	500172-B21

**NOTE:** Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.

HP Cooling Options

HP ML350 G6 Redundant Fan/Baffle Kit	515081-B21
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### Additional Options

#### HP Insight Software

#### HP Insight Control for Linux

HP Insight Control for Linux including 1yr 24x7 Support Electronic License

TC213AAE

HP Insight Control for Linux including 1yr 24x7 Support Single Server License

TC209A

HP Insight Control for Linux Media Kit

TC208A

**NOTE:** Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately.

**NOTE:** Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: <http://www.hp.com/go/ic-linux> (click on Download button).

**NOTE:** Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

**NOTE:** Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.

**NOTE:** For additional License Kits, including electronic licensing options, please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/13019\\_div/13019\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html)

#### HP Insight Control

HP Insight Software Media Kit

436222-B21

**NOTE:** Insight Software DVD media without licenses. Contains Insight Manager and Essentials software products and components licensed by Insight Control Environment suite. Uses an integrated installer to perform quick and accurate software installation and updates.

HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License

452148-B22

HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Electronic License

TC278AAE

**NOTE:** Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.

**NOTE:** Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

**NOTE:** Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

**NOTE:** Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: <http://www.hp.com/go/insightupdates>.

**NOTE:** For additional License Kits, please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12631\\_div/12631\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html)

#### HP Integrated Lights-Out (iLO) Advanced

HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License

512485-B21

**NOTE:** This license allows 1 server to be deployed and managed via HP iLO Advanced. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software



### Additional Options

#### Technical Support Service

**NOTE:** Electronic software is available in all countries except China and Japan.

Customers in China and Japan should order the physical equivalent.

**NOTE:** For additional license kits, including electronic delivery options, please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12362\\_div/12362\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html)

HP I/O Accelerator Options	HP 160GB Single Level Cell PCIe ioDrive for ProLiant Servers	600278-B21
	<b>NOTE:</b> A low-profile PCI bracket is included for use in low-profile slots.	
	HP 320GB Multi Level Cell PCIe ioDrive for ProLiant Servers	600279-B21
	<b>NOTE:</b> A low-profile PCI bracket is included for use in low-profile slots.	
	HP 320GB Single Level Cell PCIe ioDrive Duo for ProLiant Servers	600281-B21
	HP 640GB Multi Level Cell PCIe ioDrive Duo for ProLiant Servers	600282-B21
	HP 1.28TB Multi Level Cell PCIe IO Accelerator	641027-B21
	<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:	
	<a href="http://h18000.www1.hp.com/products/quickspecs/13587_div/13587_div.html">http://h18000.www1.hp.com/products/quickspecs/13587_div/13587_div.html</a>	
	(Worldwide)	

HP Graphics Options	HP 350/370G6 Graphic Card Cable Kit	537721-B21
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HP Security	HP Trusted Platform Module Option	488069-B21
	<b>NOTE:</b> The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to:	
	<a href="http://www.hp.com/go/TPM">www.hp.com/go/TPM</a> .	
	<b>NOTE:</b> ProLiant OS pre-installed units will come with the partition required for TPM deployment.	
	<b>NOTE:</b> The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.	

HP Storage Controllers	SAS Controllers	
	HP Smart Array P212 Controller	
	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21
	HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462834-B21
	HP Smart Array P410 Controller	
	HP Smart Array P410/256 2-ports Int PCIe x8 SAS Controller	462862-B21
	HP Smart Array P410/512 BBWC 2-ports Int PCIe x8 SAS Controller	462864-B21
	HP Smart Array P410/512 FBWC 2-ports Int PCIe x8 SAS Controller	578230-B21
	HP Smart Array P410/1G FBWC 2-ports Int PCIe x8 SAS Controller	572532-B21



### Additional Options

**NOTE:** HP NHP Internal SAS/SATA 4 Port Cable Kit (487734-B21) is required when adding Smart Array P410 Controller on Non-Hot Plug SATA/SAS server models.

#### HP Smart Array P411 Controller

HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller	462830-B21
HP Smart Array P411/512 BBWC 2-ports Ext PCIe x8 SAS Controller	462832-B21
HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller	578229-B21
HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller	572531-B21

#### Smart Array P812 Controller

HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller	487204-B21
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#### Optional Upgrades

HP 256MB P-series Cache Upgrade	462968-B21
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**NOTE:** Supported on HP Smart Array P212 & HP Smart Array P410/ZM Controller only.

HP 512MB P-Series Battery Backed Write Cache Upgrade	462967-B21
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**NOTE:** Supported on HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.

HP 650 mAh P-Series Battery	462969-B21
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**NOTE:** Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.

HP 15 Position 24in SFP Battery Cable Assembly	496029-B21
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**NOTE:** Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.

HP 512MB Flash Backed Write Cache	534916-B21
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**NOTE:** Supported on the Smart Array P410i Controller only.

HP 1GB Flash Backed Cache	534562-B21
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**NOTE:** Supported on the Smart Array P410i Controller only.

HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License	516471-B21
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**NOTE:** This part number can be used to purchase a single license or to order multiple licenses with a single activation key. Customers will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Include one year of 24x7 HP Software Technical Support Services.

HP 24 Bay 6Gb SAS Expander Card	468406-B21
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**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13203\\_div/13203\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html)  
(Smart Array P212 Controller)

[http://h18000.www1.hp.com/products/quickspecs/13201\\_div/13201\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html)  
(Smart Array P410 Controller)

[http://h18000.www1.hp.com/products/quickspecs/13202\\_div/13202\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html)  
(Smart Array P411 Controller)

[http://h18000.www1.hp.com/products/quickspecs/13558\\_div/13558\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13558_div/13558_div.html)  
(Smart Array P812 Controller)

[http://h18000.www1.hp.com/products/quickspecs/13200\\_div/13200\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html)  
(Smart Array Advanced Pack)



### Additional Options

#### SAS HBA

HP Modular Smart Array SC08e 2-ports Ext PCIe x8 SAS Host Bus Adapter 614988-B21

**NOTE:** Please see the QuickSpecs for additional information:

[http://h18004.www1.hp.com/products/quickspecs/13082\\_div/13082\\_div.html](http://h18004.www1.hp.com/products/quickspecs/13082_div/13082_div.html)

#### SCSI HBA

HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter 412911-B21

**NOTE:** Supports external drive attach.

HP U320e SCSI Dual Channel Host Bus Adapter AH627A

**NOTE:** Please see the following QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/12566\\_div/12566\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html)

#### HP Backup & Recovery Software

HP Basic Upgrade to Data Protector Express V6 for 1 Server E-LTU TC333BAE

HP Data Protector Express V6.0 for 1 Server E-LTU TC330BAE

HP Data Protector Express V6.0 for 10 Server E-LTU TC332BAE

HP Data Protector Express V6.0 for 3 Server E-LTU TC331BAE

#### HP Tape Backup

**NOTE:** For the complete range of tape drives, autoloaders, libraries and media see:

<http://www.hp.com/go/tape>. For hardware and software compatibility of HP tape backup products see: <http://www.hp.com/storage/SPOCK>.

HP DAT 160 SAS Internal Tape Drive Q1587A

**NOTE:** Connection using HP Smart Array P212 Controller (462828-B21) recommended.

HP DAT 160 USB Internal Tape Drive Q1580A

HP DAT 320 USB Internal Tape Drive AJ825A

HP DAT 320 SAS Internal Tape Drive AJ830A

**NOTE:** Connection using HP Smart Array P212 Controller (462828-B21) recommended.

HP Ultrium 448 SAS Internal Drive DW085A

HP LTO-4 Ultrium 1760 SAS Internal WW Tape Drive EH919A

**NOTE:** Connection using HP Smart Array P212 Controller (462828-B21) recommended.

HP LTO-4 Ultrium 1840 SAS External WW Drive EH861A

**NOTE:** Connection using HP Smart Array P212 Controller (462828-B21) recommended.

HP LTO-5 Ultrium 3000 SAS Internal Tape Drive EH957A

**NOTE:** Connection using HP Smart Array P212 Controller (462828-B21) recommended.

HP LTO-5 Ultrium 3000 SAS External Tape Drive EH958A

**NOTE:** Connection using HP Smart Array P212 Controller (462828-B21) recommended.

HP 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader AK377A

**NOTE:** Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation. Connection using HP Smart Array P212 Controller (462828-B21) recommended.

HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library BL537A

HP MSL4048 2 LTO-4 Ultrium 1760 SAS Tape Library AK380A



### Additional Options

HP MSL2024 1 LTO-4 Ultrium 1760 SAS Tape Library AK378A  
**NOTE:** Connection using HP Smart Array P212 Controller (462828-B21) recommended.

#### HP Disk Backup

**HP RDX Removable Disk Backup Systems USB**

HP RDX320 Internal Removable Disk Backup System AJ767A  
**NOTE:** For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 320GB of disk capacity per data cartridge.

HP RDX500 Internal Removable Disk Backup System AJ934A  
**NOTE:** For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 500GB of disk capacity per data cartridge.

HP RDX160 Internal Removable Disk Backup System AJ765A  
 HP RDX1000 Internal Removable Disk Backup System BV847A

#### HP Storage Options

**NOTE:** The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see:  
<http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>

##### Brocade Fibre Channel HBAs

HP 81B PCIe 8Gb Fibre Channel Single Port Host Bus Adapter AP769A  
 HP 41B PCIe 4Gb Fibre Channel Single Port Host Bus Adapter AP767A  
 HP 42B PCIe 4Gb Fibre Channel Dual Port Host Bus Adapter AP768A

##### Emulex Fibre Channel HBAs

HP 81E 8Gb Single Port PCI-e Fibre Channel Host Bus Adapter AJ762A  
 HP FC2142SR 4Gb PCIe Host Bus Adapter A8002A  
 HP FC2242SR 4Gb PCIe DC Host Bus Adapter A8003A

##### QLogic Fibre Channel HBAs

HP 81Q PCI-e Fibre Channel Host Bus Adapter AK344A  
 HP FC1142SR 4Gb PCIe Host Bus Adapter AE311A  
 HP FC1242SR 4Gb PCIe DC Host Bus Adapter AE312A

##### Converged Network Adapter

HP CN1100E Dual Port Converged Network Adapter BK835A  
 HP CN1000Q Dual Port Converged Network Adapter BS668A  
 HP CN1000E Dual Port Converged Network Adapter AW520A





## Additional Options

HP Disk Storage Systems	<b>MSA SAN Storage Arrays</b>	
	HP Storage MSA60 Array	418408-B21
	<b>NOTE:</b> Please see the QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: <a href="http://h18000.www1.hp.com/products/quickspecs/12627_div/12627_div.html">http://h18000.www1.hp.com/products/quickspecs/12627_div/12627_div.html</a> (Worldwide)	
	HP Storage MSA70 Array	418800-B21
	<b>NOTE:</b> Please see the QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: <a href="http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html">http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html</a> (Worldwide)	
	<b>Disk Enclosures</b>	
	HP Storage D2600 Disk Enclosure	AJ940A
	HP Storage D2700 Disk Enclosure	AJ941A
	<b>NOTE:</b> Please see the QuickSpecs for additional options and configuration information at: <a href="http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html">http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html</a> (Worldwide)	

HP Uninterruptible Power Systems	<b>HP Tower UPS</b>	
	<b>HP T1500 G3 UPS Models</b>	
	HP T1500 G3 1400VA INTL Tower Uninterruptible Power System	AF451A
	HP T1500 G3 1400VA NA Tower Uninterruptible Power System	AF450A
	HP T1500J JP Uninterruptible Power System	AF458A
	<b>NOTE:</b> Please see the QuickSpecs for additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/13160_div/13160_div.html">http://h18000.www1.hp.com/products/quickspecs/13160_div/13160_div.html</a> (Worldwide)	
	<b>HP T1000 G3 UPS Models</b>	
	HP T1000 G3 1000VA INTL Tower Uninterruptible Power System	AF449A
	HP T1000 G3 1000VA NA Tower Uninterruptible Power System	AF448A
	HP T1000J JP Uninterruptible Power System	AF457A
	<b>HP R1500 G3 Uninterruptible Power Supply (UPS)</b>	
	HP R1.5kVA G3 1U NA Uninterruptible Power System	AF469A
	HP R1.5kVA G3 1U JP/TW Uninterruptible Power System	AF470A
	HP R1.5kVA G3 1U INTL Uninterruptible Power System	AF471A
	<b>NOTE:</b> Please see the QuickSpecs for additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html">http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html</a> (Worldwide)	
	<b>R5000 Uninterruptible Power System (UPS)</b>	
	HP R5KVA 3U IEC309-32A High Voltage INTL Uninterruptible Power System	AF461A
	HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System	AF460A
	<b>NOTE:</b> Please see the QuickSpecs for additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/14109_div/14109_div.html">http://h18000.www1.hp.com/products/quickspecs/14109_div/14109_div.html</a> (Worldwide)	



### Additional Options

#### R7000 Uninterruptible Power System (UPS)

HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System AF462A

HP R7KVA 4U IEC-32A High Voltage INTL Uninterruptible Power System AF463A

**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/14110\\_div/14110\\_div.html](http://h18000.www1.hp.com/products/quickspecs/14110_div/14110_div.html)  
(Worldwide)

**NOTE:** Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: [www.hp.com/products/powercords](http://www.hp.com/products/powercords).

#### HP Rack Series

##### Rack 10000 G2 series

HP 10642 G2 Pallet Universal Rack AF001A

HP 10642 G2 Shock Universal Rack AF002A

HP 10642 G2 1200mm deep Shock Rack AF092A

HP 10647 G2 1200mm deep Shock Rack AF094A

#### HP Rack Options

##### Keyboards and Monitors

HP TFT7600 G2 KVM Console Rackmount Keyboard BE Monitor AZ881A

HP TFT7600 G2 KVM Console Rackmount Keyboard DK Monitor AZ876A

HP TFT7600 G2 KVM Console Rackmount Keyboard FR Monitor AZ873A

HP TFT7600 G2 KVM Console Rackmount Keyboard DE Monitor AZ872A

HP TFT7600 G2 KVM Console Rackmount Keyboard Intl Monitor AZ884A

HP TFT7600 G2 KVM Console Rackmount Keyboard IT Monitor AZ874A

HP TFT7600 G2 KVM Console Rackmount Keyboard JP Monitor AZ882A

HP TFT7600 G2 KVM Console Rackmount Keyboard NO Monitor AZ877A

HP TFT7600 G2 KVM Console Rackmount Keyboard PT Monitor AZ880A

HP TFT7600 G2 KVM Console Rackmount Keyboard RU Monitor AZ883A

HP TFT7600 G2 KVM Console Rackmount Keyboard SE/FI Monitor AZ878A

HP TFT7600 G2 KVM Console Rackmount Keyboard ES Monitor AZ875A

HP TFT7600 G2 KVM Console Rackmount Keyboard CH Monitor AZ879A

HP TFT7600 G2 KVM Console Rackmount Keyboard UK Monitor AZ871A

HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor AZ870A

HP TFT7600 G2 KVM Console Rackmount Keyboard US TAA Monitor AZ885A

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13731\\_div/13731\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13731_div/13731_div.html)  
(Worldwide)

HP 1U IT Rackmount Keyboard with USB AG076A

HP 1U US Rackmount Keyboard with USB AG072A

HP 1U BE Rackmount Keyboard with USB AG083A

HP 1U DK Rackmount Keyboard with USB AG078A



### Additional Options

HP 1U FR Rackmount Keyboard with USB	AG075A
HP 1U DE Rackmount Keyboard with USB	AG074A
HP 1U INT Rackmount Keyboard with USB	AG086A
HP 1U NO Rackmount Keyboard with USB	AG079A
HP 1U PT Rackmount Keyboard with USB	AG082A
HP 1U RU Rackmount Keyboard with USB	AG085A
HP 1U ES Rackmount Keyboard with USB	AG077A
HP 1U SE/FI Rackmount Keyboard with USB	AG080A
HP 1U Rackmount Keyboard with USB	AG081A
HP 1U UK Rackmount Keyboard with USB	AG073A
HP 1U JP Rackmount Keyboard with USB	AG084A

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/12465\\_div/12465\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12465_div/12465_div.html)  
(Worldwide)

**NOTE:** For additional information regarding Rack Options, please see the following URL: <http://www.hp.com/go/rackandpower>.

#### HP Server Console Switches

HP Server Console 0x2x8 Port Analog Switch	AF616A
HP Server Console 0x2x16 Port Analog Switch	AF617A

Please see the QuickSpecs for Technical Specifications and additional information:  
[http://h18000.www1.hp.com/products/quickspecs/11834\\_div/11834\\_div.html](http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html)  
(Worldwide)

#### HP Server Console Switch G2 with Virtual Media & CAC

HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13475\\_div/13475\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html)  
(Worldwide)

#### HP IP Console Switch G2 with Virtual Media & CAC

HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software	AF620A
HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software	AF621A
HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software	AF622A

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13474\\_div/13474\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html)  
(Worldwide)

#### Rack Kits

HP ML350G6 Tower to Rack Conversion Kit	534534-B21
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Additional Options

HP USB and SD Options	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	<b>NOTE:</b> HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to <a href="#">HP VMware Getting Started Guide</a> for installation instructions.	
	HP 4GB Secure Digital High Capacity Flash Media Kit	580387-B21
	<b>NOTE:</b> Blank SD media device is supported for use with VMware and Citrix. SD media must be installed in the internal slot of the ProLiant server. Learn more at <a href="http://www.hp.com/go/proliantvirtualization">http://www.hp.com/go/proliantvirtualization</a> .	
	HP USB 2-Button Optical Scroll Mouse	DC172B
	HP USB Standard Keyboard US	DT528A#ABA
<hr/>		
HP Care Pack Services	<b>Hardware Services On-site Service</b>	
	HP 3 year 4 hour 13x5 ProLiant ML350 Hardware Support	U4512E
	HP 3 year 4 hour 24x7 ProLiant ML350 Hardware Support	U4513E
	HP 3 year 6 hour 24x7 Call to Repair ProLiant ML350 Hardware Support	U4514E
	<b>Installation &amp; Start-up Services</b>	
	HP Install ProLiant ML350 Service	U4522E
	HP Startup ProLiant ML350 Service	U4523E
	<b>Support Plus 24</b>	
	HP 3 year Support Plus 24 Microsoft ProLiant ML350 Service	U4525E
	HP 3 year Support Plus 24 SuSE ProLiant ML350 Service	U6308E

## Memory

**NOTE:** Memory configurations listed do not apply to "Factory Integrated Models".

### DDR3 memory population guidelines

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:

[www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator)

Some DIMM installation guidelines are summarized below:

- For servers with eighteen (18) memory slots:
  - There are three (3) channels per processor; six (6) channels per server
  - There are three (3) DIMM slots for each memory channel; eighteen (18) total slots
  - Memory channel 1 consists of the three (3) DIMMs that are closest to the processor
  - Memory channel 3 consists of the three (3) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible
- If any Quad rank DIMMs are installed, all channels are limited to only 2 DIMMs per channel
- You can only install two quad-rank DIMMs per channel
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5; 3,6 on a 3DPC system or 1,4; 2,5; on a 2DPC system
- Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors
- If mixing DIMM voltage is a requirement, please note that the DIMMs will run at 1.5V since all 1.35V are capable of supporting 1.5V operations

DIMM slot/capacity/populated speed table											
DIMM Type ->	Registered DIMMS (RDIMMs)								Unbuffered with ECC DIMMs (UDIMMs)		
DIMM Rank ->	Single Rank (1R)	Dual Rank (2R)					Quad Rank (4R)		Single Rank (1R)	Dual Rank (2R)	
DIMM Capacity ->	4GB	2GB	4GB	8GB	8GB	16GB	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz) ->	1333	1333	1333	1067	1333	1333	1067	1067	1333	1333	1333
Voltage	LV/Std	Std	Std	Std	LV/Std	LV/Std	Std	Std	Std	Std	Std
SLOTS THAT CAN BE POPULATED											
18 slot servers	18	18	18	18	18	18	12	12	12	12	12
MAXIMUM CAPACITY (GB)											



### Memory

18 slot servers	72	36	72	144	144	288	48	192	12	24	48
POPULATED DIMM SPEED (MHz)											
1 DIMM Per Channel	1333	1333	1333	1067	1333	1333	1067	1067	1333	1333	1333
2 DIMM Per Channel	1333*	1333*	1333*	1067	1333*	1066/1333**	800	800	1333	1333	1333*
3 DIMM Per Channel	800	800	800	800	800	800***	n/a	n/a	n/a	n/a	n/a
* Supported with ROM update via ROM Based Setup Utility (RBSU). UDIMM support is only on 12-slot servers.											
** 2DPC: LV runs at 1066, Std voltage runs at 1333											
** 3DPC: LV/Std voltage runs at 800											

### NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz
- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, the maximum speed will be 1066MHz If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, the maximum speed will be 1066MHz
- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, you run at 1066MHz
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz
- Maximum memory speed will also depend on the processor installed
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

### DIMM slot and configuration diagrams

#### Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

18 DIMM SLOTS (9 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G	1	G	Chnl 1
	2	D	2	D	
	3	A	3	A	
Chnl 2	4	H	4	H	Chnl 2
	5	E	5	E	
	6	B	6	B	
Chnl 3	7	I	7	I	Chnl 3
	8	F	8	F	
	9	C	9	C	



## Memory

### Standard memory configuration (1 CPU model)

- 6GB, consisting of three (3) 2GB dual-rank PC3-10600 RDIMMs (Base Model)

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; empty	2	D; empty	
	3	A; 2GB RDIMM	3	A; empty	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; empty	5	E; empty	
	6	B; 2GB RDIMM	6	B; empty	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; empty	8	F; empty	
	9	C; 2GB RDIMM	9	C; empty	

### Standard memory plus optional memory (1 CPU model)

- 54GB, consisting of three (3) 2GB RDIMMs plus six (6) 8GB RDIMMs (Base Model)
  - 3x 2GB dual-rank PC3-10600 RDIMMs
  - 6x 8GB dual-rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; 8GB RDIMM	1	G; empty	Chnl 1
	2	D; 8GB RDIMM	2	D; empty	
	3	A; 2GB RDIMM	3	A; empty	
Chnl 2	4	H; 8GB RDIMM	4	H; empty	Chnl 2
	5	E; 8GB RDIMM	5	E; empty	
	6	B; 2GB RDIMM	6	B; empty	
Chnl 3	7	I; 8GB RDIMM	7	I; empty	Chnl 3
	8	F; 8GB RDIMM	8	F; empty	
	9	C; 2GB RDIMM	9	C; empty	

### Standard memory replaced with optional memory (1 CPU model)

#### RDIMM maximum configuration (1 CPU model)

- 96GB, consisting of six (6) 16GB quad-rank PC3-8500 RDIMMs



## Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 16GB RDIMM	2	D; empty	
	3	A; 16GB RDIMM	3	A; empty	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 16GB RDIMM	5	E; empty	
	6	B; 16GB RDIMM	6	B; empty	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 16GB RDIMM	8	F; empty	
	9	C; 16GB RDIMM	9	C; empty	

### UDIMM maximum configuration (1 CPU model)

- 24GB, consisting of six (6) 4GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 4GB UDIMM	2	D; empty	
	3	A; 4GB UDIMM	3	A; empty	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 4GB UDIMM	5	E; empty	
	6	B; 4GB UDIMM	6	B; empty	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 4GB UDIMM	8	F; empty	
	9	C; 4GB UDIMM	9	C; empty	

### Standard memory replaced with optional memory (2 CPU model)

#### RDIMM maximum configuration (2 CPU model)

- 288GB, consisting of eighteen (18) 16GB dual-rank PC3L-10600 RDIMMs





## Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 16GB RDIMM	2	D; 16GB RDIMM	
	3	A; 16GB RDIMM	3	A; 16GB RDIMM	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 16GB RDIMM	5	E; 16GB RDIMM	
	6	B; 16GB RDIMM	6	B; 16GB RDIMM	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 16GB RDIMM	8	F; 16GB RDIMM	
	9	C; 16GB RDIMM	9	C; 16GB RDIMM	

### UDIMM maximum configuration (2 CPU model)

- 48GB, consisting of twelve (12) 4GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 4GB UDIMM	2	D; 4GB UDIMM	
	3	A; 4GB UDIMM	3	A; 4GB UDIMM	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 4GB UDIMM	5	E; 4GB UDIMM	
	6	B; 4GB UDIMM	6	B; 4GB UDIMM	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 4GB UDIMM	8	F; 4GB UDIMM	
	9	C; 4GB UDIMM	9	C; 4GB UDIMM	

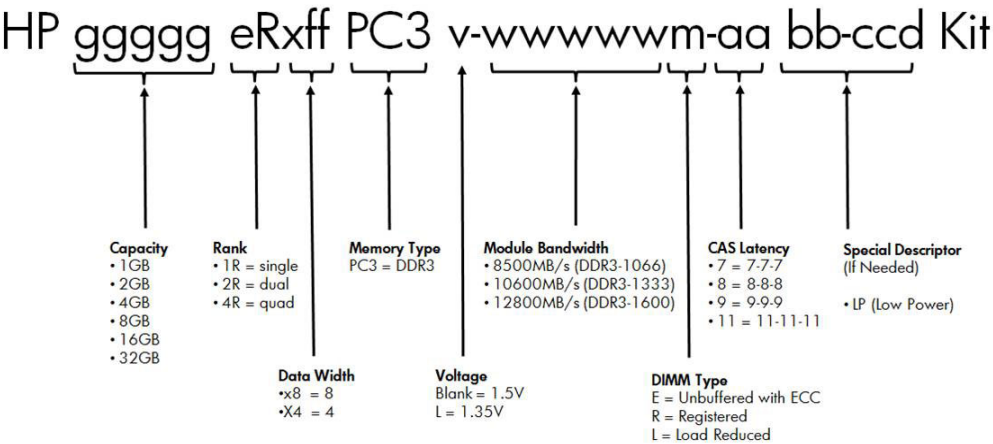
**NOTE:** Capacity references are rounded to the common Gigabyte values.

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB

DDR3 memory options part number decoder



Memory



Following are memory options available from HP:

Memory	<b>Registered DIMMs (RDIMMs)</b>	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604506-B21
	<b>NOTE:</b> Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors	
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
	<b>Unbuffered with ECC DIMMs (UDIMMs)</b>	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21

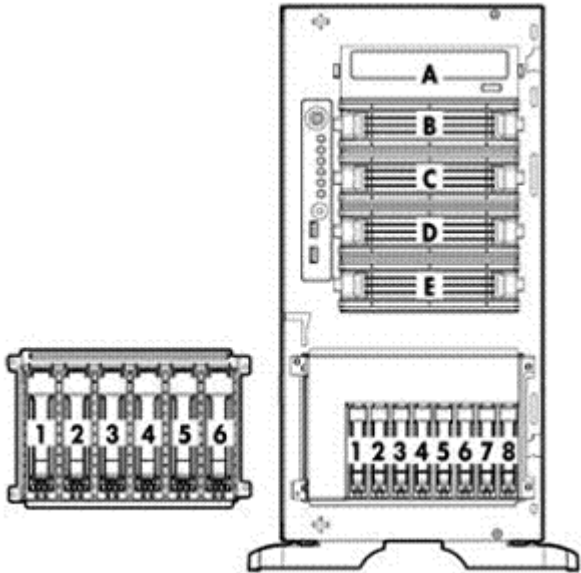
## Memory

**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator).

**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>



Storage



1 - 6    6 x 3.5" (LFF) Hot-Plug SAS/SATA hard drive bays

Or

1 - 8    8 x 2.5" (SFF) Hot-Plug SAS/SATA hard drive bays

B,C,D,E Available half height media bays

A-E    Removable Optical Drive

D+E    8 x 2.5" (SFF) Hot-Plug SAS/SATA hard drive bays  
or  
2 x 3.5" (LFF) Hot-Plug SAS/SATA hard drive bays

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
HP Half-Height SATA DVD-ROM Optical Drive	Up to 1	A-E	Integrated SATA Controller
HP Half-Height SATA DVD RW Optical Drive	Up to 1	A-E	Integrated SATA Controller

Hard Drives

**NOTE:** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

**NOTE:** Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
900GB 6G SAS 10K	Up to 16 SFF	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
600GB 6G SAS 10K			HP Smart Array P212/ 256 MB Controller
450GB 6G SAS 10K			HP Smart Array P410/256 MB Controller
300GB 6G SAS 10K			HP Smart Array P410/512 MB BBWC Controller
300GB 6G SAS 15K			HP Smart Array P410/512 MB FBWC Controller
146GB 6G SAS 15K			HP Smart Array P410/1G FBWC Controller
72GB 6G SAS 15K			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

### Storage

#### SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K	Up to 8 LFF	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
450GB 6G SAS 15K			HP Smart Array P212/ 256 MB Controller
300GB 6G SAS 15K			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

#### SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
3TB 6G SAS 7.2K	Up to 6 LFF	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
2TB 6G SAS 7.2K			HP Smart Array P212/ 256 MB Controller
1TB 6G SAS 7.2K			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

#### SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 6G SAS 7.2K	Up to 16 SFF	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
500GB 6G SAS 7.2K			HP Smart Array P212/ 256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

#### SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives



### Storage

	Quantity Supported	Position Supported	Controller
500GB 3G SATA 7.2K	Up to 16	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
160GB 3G SATA 7.2K			HP Smart Array P212/ 256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

	Quantity Supported	Position Supported	Controller
<b>SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives</b>			
3TB 3G SATA 7.2K	Up to 6 LFF	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
2TB 3G SATA 7.2K			HP Smart Array P212/ 256 MB Controller
1TB 3G SATA 7.2K			HP Smart Array P410/256 MB Controller
500GB 3G SATA 7.2K			HP Smart Array P410/512 MB BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

### SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K	Up to 8	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
160GB 3G SATA 7.2K			HP Smart Array P212/ 256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

### SATA Hot Plug Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
120GB 3.0G SATA	Up to 16	1-8 and D+E	HP Smart Array P212/Zero Memory Controller



### Storage

60GB 3.0G SATA

HP Smart Array P212/ 256 MB Controller  
 HP Smart Array P410/256 MB Controller  
 HP Smart Array P410/512 MB BBWC Controller  
 HP Smart Array P410/512 MB FBWC Controller  
 HP Smart Array P410/1G FBWC Controller  
 HP Smart Array P411/256 MB Controller  
 HP Smart Array P411/512 MB BBWC Controller  
 HP Smart Array P411/512 MB FBWC Controller  
 HP Smart Array P411/1G FBWC Controller  
 HP Smart Array P812/1G Flash Backed Cache Controller

### SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
120GB 3.0G SATA	Up to 8	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
60GB 3.0G SATA			HP Smart Array P212/ 256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller HP Smart Array P410/512 MB FBWC Controller HP Smart Array P410/1G FBWC Controller HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller HP Smart Array P411/512 MB FBWC Controller HP Smart Array P411/1G FBWC Controller HP Smart Array P812/1G Flash Backed Cache Controller

### External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
70 Modular Smart Array	Up to 2	External	HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller
	Up to 4	External	HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller HP Smart Array P411/512 MB FBWC Controller HP Smart Array P411/1G FBWC Controller HP Smart Array P812/1G Flash Backed Cache Controller HP Smart Array P800 Controller
D2700 Disk Enclosure	Up to 2 Up to 4	External	HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller HP Smart Array P411/512 MB FBWC Controller HP Smart Array P411/1G FBWC Controller HP Smart Array P812/1G Flash Backed Cache Controller

### Tape and Disk-Based Backup



### Storage

**NOTE:** For the complete range of tape drives, autoloaders, libraries and media, including the internal fitting models, see: <http://www.hp.com/go/tape>. For the complete range of D2D Backup Systems see: <http://www.hp.com/go/d2d>. For the complete range of RDX drives and media see: <http://www.hp.com/go/rdx>. For hardware and software compatibility of HP disk and tape backup products see: <http://www.hp.com/storage/SPOCK>.

	Position Supported	Controller	Controller/HBA Option Kit Part Number
<b>HP SCSI Tape Drives</b>	Internal or External	HP SC11Xe Host Bus Adapter HP U320e SCSI Dual Channel Controller <b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	412911-B21 AH627A
LTO-1 Ultrium 232			
LTO-2 Ultrium 448			
LTO-3 Ultrium 920			
LTO-3 Ultrium 960			
LTO4 Ultrium 1760			
LTO-4 Ultrium 1840			
DAT 40			
DAT 72			
DAT 160			
<b>HP SCSI Rack Mount Kits</b>	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
1U Rack-Mount Kit			
3U Rack-Mount Kit			
<b>HP USB Tape Drives</b>	Internal or External	USB 2.0 Port	N/A
DAT 40			
DAT 72			
DAT 160			
DAT 320			
<b>HP USB Rack Mount Kits</b>	External	USB 2.0 Port	
1U USB Rack-Mount Kit			
<b>HP SAS Tape Drives</b>	Internal or External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller <b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	462828-B21
DAT 160			
DAT 320			
LTO-2 Ultrium 448			
LTO-3 Ultrium 920			
LTO-4 Ultrium 1760			
LTO-4 Ultrium 1840			
LTO-5 Ultrium 3000			
LTO-5 Ultrium 3280			
<b>HP SAS Rack Mount Kits</b>	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller <b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	462828-B21
1U Rack-Mount Kit			
3U Rack-Mount Kit			





### Storage

<b>HP SCSI Tape Autoloaders</b> DAT 72x10 Autoloader 1/8 G2 Autoloader	External	HP SC11Xe Host Bus Adapter HP U320e SCSI Dual Channel Controller	412911-B21 AH627A
<b>HP SCSI Tape Libraries</b> MSL2024 MSL4048 MSL8096 MSL6000	External	HP StorageWorks U320e SCSI Dual Channel Host Bus Adapter <b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	AH627A
<b>HP SAS Tape Autoloaders and Libraries</b> 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller <b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	462828-B21
<b>HP Fibre Channel Tape Libraries</b> MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: <a href="http://www.hp.com/go/ebs">http://www.hp.com/go/ebs</a> for connectivity information and the supported Fibre Channel HBAs shown in this QuickSpec.	
<b>HP USB RDX Removable Disk Backup System</b> RDX160 RDX320 RDX500 RDX750 RDX1TB	Internal or External	USB 2.0 port	N/A
<b>HP D2D Backup Systems, iSCSI</b> D2D2500i D2D4000i	External	Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	
<b>HP D2D Backup Systems, Fibre Channel</b> D2D4000fc	External	Direct server attach is not supported, requires connection via SAN fabric. See: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	



### Power Specifications

HP 460W Common Slot Gold Hot Plug Power Supply Kit							
Part Number	503296-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	460	460	460	460	460	460	460
Nominal Input Current (A rms)	5.5	4.5	2.6	2.5	2.4	2.3	2.2
Maximum Rated Input Wattage Rating (Watts)	526	520	505	505	503	503	503
Maximum Rated VA (Volt-Amp)	548	542	527	527	524	524	524
Efficiency (%)	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1794	1773	1725	1725	1715	1715	1715

HP 750W Common Slot Gold Hot Plug Power Supply Kit							
Part Number	512327-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current (A rms)	8.9	7.4	4.3	4.1	3.9	3.7	3.6
Maximum Rated Input Wattage Rating (Watts)	857	847	824	825	820	820	820
Maximum Rated VA (Volt-Amp)	894	884	859	859	854	854	854
Efficiency (%)	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	2925	2892	2812	2812	2797	2797	2797



### Power Specifications

HP 1200W Common Slot Silver Hot Plug Power Supply Kit							
Part Number	500172-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	800	900	1200	1200	1200	1200	1200
Nominal Input Current (A rms)	9.7	9.0	7.0	6.8	6.4	6.1	5.9
Maximum Rated Input Wattage Rating	930	1034	1348	1348	1348	1348	1348
Maximum Rated VA (Volt-Amp)	970	1079	1406	1406	1406	1406	1406
Efficiency (%)	86	87	89	89	89	89	89
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	3174	3530	4600	4600	4600	4600	4600

**NOTE:** To review typical system power ratings use the HP Power Advisor which is available online located at url: [www.hp.com/go/proliant-energy-efficient](http://www.hp.com/go/proliant-energy-efficient) or [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor).

**NOTE:** Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.



Technical Specifications

System Unit	Tower Dimensions (H x W x D) (with feet/bezel)	18.5 x 8.59 x 23.46 in (47 x 21.8 x 59.6 cm)	
	Rack Dimensions (H x W x D) (with feet/bezel)	8.54 x 17.5 x 21.9 in. (21.7 x 44.5 x 55.7cm)	
	Tower Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	70 lb (31.8 kg)
		Minimum (one hard drive, power supply, and processor installed)	54 lb (24.5 kg)
	Rack Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	66 lb (29.9 kg)
		Minimum (one hard drive, power supply, and processor installed)	48 lb (21.8 kg)
	Input Requirements (per power supply)	Rated Line Voltage	100 to 240 VAC
		Rated Input Current	7.1 Amps (at 120VAC) to 3.5 Amps (at 240 VAC)
		Rated Input Frequency	50 to 60 Hz
		Rated Input Power	852 W
	BTU Rating	Maximum	460W - 1773 BTU / hr (at 120 VAC), 1715 (at 240 VAC) 750W - 2892 BTU / hr (at 120 VAC), 2797 (at 240 VAC) 1200W - 3530 BTU / hr (at 120 VAC), 4600 (at 240 VAC)
	Power Specifications	To review typical system power ratings use the HP Power Advisor which is available via the online tool located at URL: <a href="http://www.hp.com/go/proliant-energy-efficient">www.hp.com/go/proliant-energy-efficient</a>  - Click on the system of interest. Example: ML350 G6 - Follow the instructions of the next screens.	
	Power Supply Output (per power supply)	Rated Steady-State Power	460(750) W (at 100 VAC), 460(750) W (at 200 VAC)
		Maximum Peak Power	460(750) W (at 100 VAC), 460(750) W (at 200 VAC)  <b>NOTE:</b> See Power Supply Specifications tables for complete details on 460W PSU and optional 750W and 1200W Power Supply Options.
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m



Technical Specifications

		(1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).								
Relative Humidity (non-condensing)	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).								
	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.								
	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.								
Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).								
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).								
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).  Idle <table><tr><td>L WAd</td><td>4.7 B (1P Non-Redundant) 4.6 B (2P Redundant)</td></tr><tr><td>L pAm</td><td>32.48dB (1P Non-Redundant) 31.18dB (2P Redundant)</td></tr></table> Operating <table><tr><td>L WAd</td><td>4.8 B (1P Non-Redundant) 4.7 B (2P Redundant)</td></tr><tr><td>L pAm</td><td>32.39dB (1P Non-Redundant) 31.62dB (2P Redundant)</td></tr></table>		L WAd	4.7 B (1P Non-Redundant) 4.6 B (2P Redundant)	L pAm	32.48dB (1P Non-Redundant) 31.18dB (2P Redundant)	L WAd	4.8 B (1P Non-Redundant) 4.7 B (2P Redundant)	L pAm	32.39dB (1P Non-Redundant) 31.62dB (2P Redundant)
L WAd	4.7 B (1P Non-Redundant) 4.6 B (2P Redundant)									
L pAm	32.48dB (1P Non-Redundant) 31.18dB (2P Redundant)									
L WAd	4.8 B (1P Non-Redundant) 4.7 B (2P Redundant)									
L pAm	32.39dB (1P Non-Redundant) 31.62dB (2P Redundant)									
Emissions Classification (EMC)	FCC Rating	Class B								
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1								

NOTE: The Listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.



Technical Specifications

Smart Array P410i Controller	Dimensions	Embedded	
	Disk Drive and Enclosure Interface - Transfer rate	6Gb/s SAS (Serial Attached SCSI)	
		3Gb/s SATA (Serial ATA)	
	SAS Connectors	2 internal 4X connectors	
	Cache Memory Speed	DDR2-800MHz with 40 or 72-bit wide bus	
	Server Interface	x4 PCIe 2.0 provides 2GB/s maximum bandwidth	
	SAS Speed	8 6Gb/s SAS links provide 4.8GB/s maximum bandwidth	
	Cache Memory	Zero Memory RAID has no cache memory	
		40-bit 256MB ECC protected cache (battery upgrade available)	
		72-bit 512MB BBWC or 72-bit 512MB and 1G FBWC	
	Logical Drives Supported	Zero Memory, Up to 2 logical volumes (8 physical drives) Up to 64 logical drives with cache	
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space	
	RAID Support	RAID 6, 6+0 (Advanced Data Guarding) <b>NOTE:</b> RAID 6, 6+0 can be enabled with one of the following combinations: <ul style="list-style-type: none"><li>256 MB cache, Battery kit and Smart Array Advanced Pack License key option upgrades</li><li>512 MB BBWC/FBWC and Smart Array Advanced Pack License key option upgrades</li><li>1G FBWC and Smart Array Advanced Pack License key option upgrades</li></ul> RAID 5, 5+0 (Distributed Data Guarding) <b>NOTE:</b> A minimum of 256 MB cache is required to enable RAID 5, 5+0 support RAID 1+0 (Striping & Mirroring) RAID 0 (Striping), RAID 1 (Mirroring)	
Embedded NC326i PCI Express Dual Port Gigabit Server Adapter	Network Interface	10Base-T/100Base-TX/1000Base-TX	
	Compatibility	IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
	Data Transfer Method	PCI Express, four lanes (x4)	
	Controller	BCM5715	
		10Base-T (Half-Duplex) 10 Mb/s	
	Network Transfer Rate	10Base-T (Full-Duplex) 20 Mb/s	
		100Base-TX (Half-Duplex) 100 Mb/s	
		100Base-TX (Full-Duplex) 200 Mb/s	
		1000Base-TX (Half and Full-Duplex) 2000Mb/s	
	Connector	RJ-45	

Technical Specifications

	Cable Support	10Base-T 10/100/1000Base-TX	Categories 3, 4 or 5 UTP; up to 328 ft (100 m) Category 5 UTP; up to 328 ft (100 m)
Environment-friendly Products and Approach	End-of-life Management and Recycling	<p>Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.</p>	

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.